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MUSTARD SEED: SITUATION AND OUTLOOK

Canada is the largest exporter and the second largest producer of mustard seed in the world. The value of Canadian mustard seed exports averaged about $70 million during the past five years. For 2007-2008, Canadian seeded area and production are forecast to increase from 2006-2007. Supply is expected to decrease because sharply lower carry-in stocks are expected to more than offset the increase in production. This issue of the *Bi-weekly Bulletin* examines the situation and outlook for mustard seed.

WORLD

Production and Trade

India produces the bulk of world mustard seed. However production data for India, as well as two other significant producers, Pakistan and Bangladesh, is not available since these countries combine the production data for mustard seed and rapeseed. Mustard seed produced in India, Pakistan and Bangladesh, as well as in most other Asian countries, is mainly crushed for oil. Excluding these three countries, mustard seed production has been variable.

Mustard seed exports have also been variable, but with a slight upward trend, peaking at 315,000 tonnes (t) in 2006. Canada accounted for about 55% of total world exports during the past five years, if re-exports are excluded. The only other significant exporters are Russia, Ukraine and the Czech Republic. Exports from Germany, Netherlands and Belgium are re-exports of imported seed. The top five importing countries, United States (US), Germany, Bangladesh, France and Netherlands, accounted for about 70% of world imports.

WORLD: MUSTARD SEED PRODUCTION*

	2003	2004	2005	2006	2007f
Harvested Area (kha)	1,055	993	674	610	650
Average Yields (t/ha)	0.67	0.83	0.86	0.79	0.80
Canada	226	306	201	116	145
Nepal	125	133	142	135	135
United States	35	26	16	13	20
Russia	86	55	63	60	60
Ukraine	69	148	47	50	50
Myanmar	40	49	40	40	40
Czech Republic	60	43	26	25	25
China	15	15	16	15	15
Romania	15	14	1	5	5
Hungary	10	14	6	5	5
Germany	4	4	7	5	5
Slovakia	6	3	1	2	2
France	2	2	2	2	2
Other	11	9	11	11	11
Total	**704**	**821**	**579**	**484**	**520**

* Partial. India, Pakistan and Bangladesh are important producers, but mustard seed production data for these countries is not available as it is combined with rapeseed production data.

f: forecast, Agriculture and Agri-Food Canada, June 2007
Source: FAO, Statistics Canada and USDA, June 2007

CANADA

Production

The three types of mustard seed produced in Canada are yellow (*Sinapis alba*), brown, and oriental (both *Brassica juncea*). Mustard seed can be grown on most soil types, but is best adapted to the brown and dark brown soils. Soils prone to crusting and dry, sandy soils are not recommended. All mustard seed types tolerate drought conditions better than canola. Mustard seed fits well in a rotation with cereal grains. Yellow mustard seed requires 90-92 days to mature, brown 85 days and oriental 86-88 days. Seedlings are quite tolerant of frost. Therefore, early seeding is recommended to avoid flowering during the hottest part of the summer, thereby improving yields. The Canadian mustard seed harvest normally occurs from mid-August to late September.

Canadian mustard seed production has been variable during the past 10 years, ranging from a low of 105,000 t in 2001-2002 to a high of 306,000 t in 2004-2005. Production fell during the next two years because of declining seeded areas and lower yields. The seeded area decreased because of historically low prices. Saskatchewan dominates Canadian mustard seed production with 78% of the production in 2006-2007, followed by Alberta at 21% and Manitoba at 1%.

Canada

Production by type varies from year to year depending on price prospects for each type of mustard seed. The yields of brown and yellow mustard seed are about 5% and 20% lower than oriental, respectively. Since the costs of production are similar for all types, expected prices for brown mustard seed have to be about 5% higher and for yellow mustard seed about 25% higher compared to oriental mustard seed to encourage production of the brown and yellow types rather than the oriental type.

The quality of the 2006-2007 crop was higher than normal. According to a survey conducted by Saskatchewan Agriculture and Food, about 84% of the mustard seed in that province graded 1 Canada (normally 74%), 15% graded 2 Canada (18%), 1% graded 3 Canada (5%) and none graded 4 Canada and Sample (3%).

Uses

Mustard seed is a nutritious food ingredient. Its high protein content of 20-32% is of particular interest when used in processed meats. The volatile oil in mustard seed inhibits growth of certain yeasts, moulds and bacteria, which enables mustard seed to function as a natural preservative and extends the shelf life of finished foods.

Yellow mustard seed is suitable for a wide range of applications, including dry milling for flour, wet milling for mustard pastes, and whole ground seed for spice mixes, meat processing and other food products. It is the type of mustard seed used for processing into the familiar North American hot dog mustard, which uses the whole seed for a milder product. In processed meats, it is used as a binder and a protein extender, and to enhance the flavour. It is also used in mayonnaise and salad dressings. Dry milled flour is used for condiments and as an ingredient in processed meat products. The extracted seed hulls are used for thickening and stabilization in mustard and other prepared foods. Mucilage is a gummy substance found in the seed coat of yellow mustard seed. It absorbs water, keeps meat dry and is a binding and thickening agent in meat and soup. Since there are several varieties of yellow mustard seed grown in Canada, there is a range of mucilage contents available, allowing processors to blend varieties to reach a standard viscosity. Yellow mustard seed can also be ground for use as an ingredient for the prepared meat industry, where it contributes to total protein. As well, the gelling of the mucilage increases water absorption into the product which provides enhanced economy and improved efficiency in the smooth moulding of shaped products. Heat inactivated (spice heat removed) whole ground seed is used as an ingredient in many food products providing colour, flavour, viscosity and emulsification. The oil content of yellow mustard seed is 24-35% and the protein content is 20-32%.

Brown mustard seed is ground into flour which is used to produce a hot mustard used in European products. The flour is also used in mayonnaise, salad dressing and sauces. The oil content of brown mustard seed is 35-45% and the protein content is 20-24%. The fixed oil content of Canadian brown mustard seed gives no separation problems and the volatile oil content

CANADA: MUSTARD SEED SUPPLY AND DISPOSITION

crop year (August-July)	2003 -2004	2004 -2005	2005 -2006	2006 -2007f	2007 -2008f
Seeded Area (kha)	340	317	212	144	170
Harvested Area (kha)	328	304	206	140	164
Yield (t/ha)	0.69	1.01	0.98	0.83	0.88
	.....	.....	thousand tonnes	.....	.....
Carry-in stocks	60	92	194	190	100
Production:					
Yellow	*124*	*141*	*80*	*57*	*75*
Brown	*67*	*84*	*57*	*32*	*39*
Oriental	*35*	*81*	*64*	*27*	*31*
Total Production	**226**	**306**	**201**	**116**	**145**
Imports	2	1	0	1	0
Total Supply	**288**	**399**	**395**	**307**	**245**
Exports:					
United States	53	54	55	60	58
Europe	45	42	44	50	49
Asia	18	17	28	24	22
South and Central America	2	2	3	3	3
Africa, the Middle East and Oceania	3	4	3	3	3
Total Exports	**121**	**119**	**133**	**140**	**135**
Total Domestic Use	75	86	72	67	65
Total Use	**196**	**205**	**205**	**207**	**200**
Carry-out Stocks	**92**	**194**	**190**	**100**	**45**
Stocks-to-use ratio (%)	47	95	93	48	23
Seeded Area (kac)	840	783	524	356	420
Harvested Area (kac)	810	751	509	346	405
Yield (lb/ac)	615	898	871	739	789
Average producer price*					
Yellow					
$/t	386	309	276	419	507
$/lb	0.175	0.140	0.125	0.195	0.230
Brown					
$/t	386	309	265	353	419
$/lb	0.175	0.140	0.120	0.165	0.190
Oriental					
$/t	419	309	265	298	375
$/lb	0.190	0.140	0.120	0.140	0.180

*Saskatchewan, No.1 CAN grade

f: forecast, AAFC, June 2007

Source: Statistics Canada and AAFC

has long been the standard in formulations. Fixed oil is the oil obtained in crushing the seed, whereas volatile oil is a breakdown product from glucosinolates. Volatile oil gives mustard the spicy taste.

Canadian ***oriental mustard seed*** varieties have been bred for specific levels of oil and volatility to meet alternative market requirements. High volatility, high oil content oriental mustard seed varieties are suitable for the oilseed demand in the Indian sub-continent, while low volatility, low oil content mustard seed varieties are suitable for dry milling purposes. Stronger flavoured oriental mustard seed varieties are also available if the miller or processor requires it. The oil content of oriental mustard seed is 35-50% and the protein content is 20-24%.

Marketing

All of the mustard seed produced in Canada is sold on the open market to dealers who buy, clean, and ship mustard seed to domestic and export markets. Mustard seed is shipped both bulk and in containers, depending on the volume and destination. Deliveries to domestic and US customers are in bulk in trucks or in containers which are carried by trucks or trains

The Canadian Special Crops Association (CSCA) (www.specialcrops.mb.ca) establishes trade rules for domestic trade and serves as a forum for exporters, dealers and brokers involved in the industry of trading Canada's pulse and special crops, including mustard seed. The CSCA's website includes a section where buyers can submit a request for prices.

The Canadian Grain Commission (CGC) administers quality control standards for mustard seed. There are four grades for each type of mustard seed. In addition, mustard seed can be graded "Sample" if it does not meet the specifications for any of the four grades. Top grades of mustard seed are obtained when seeds are well matured, have good colour with minimal damage, and are free of seeds from volunteer canola plants and weeds such as cow cockle. For further information, or to access the Official Grain Grading Guide, please visit the CGC website: (www.grainscanada.gc.ca)

Domestic Use

Canadian domestic use, which includes food, seed, dockage and waste, accounts for about 35% of the total use. There is some processing of mustard seed in Canada, concentrating on milling seed for its flour and for condiments. Most of the mustard seed processed in Canada is the yellow type; however some brown and oriental types are also milled mainly to be blended with yellow mustard flour for customers who want a spicier product.

Exports

Canadian mustard seed exports are mainly in the bulk, unprocessed form. Europe (mainly Belgium, the Netherlands, Germany, France and United Kingdom), Asia (mainly Bangladesh, India, Japan, Thailand and South Korea), and the US account for the majority of the exports. Europe imports mainly brown mustard seed, Asia mainly oriental and the US mainly yellow.

For 2006-2007, Canadian exports are expected to increase slightly from 2005-2006 due to stronger demand from the US, where production fell.

In addition to seed exports, some of the mustard seed flour produced in Canada is exported to the US and other markets.

WORLD: MUSTARD SEED EXPORTS

calendar year	**2002**	**2003**	**2004**	**2005**	**2006**
Canada	151	124	116	125	168
Russia	13	42	23	15	51
Ukraine	6	39	68	66	27
Czech Republic	18	24	25	25	21
Netherlands*	13	13	9	8	12
Germany*	17	14	15	15	11
India	11	10	13	8	8
Belgium*	1	4	6	4	4
Hungary	12	9	5	7	3
Romania	3	3	4	2	3
United States	10	5	4	4	2
Other	6	7	8	5	5
Total	**261**	**294**	**296**	**284**	**315**

* re-exports

WORLD: MUSTARD SEED IMPORTS

calendar year	**2002**	**2003**	**2004**	**2005**	**2006**
United States	42	49	50	57	62
Germany	40	42	40	39	36
Bangladesh	41	54	37	23	35
France	27	30	29	33	25
Netherlands	16	14	13	16	16
Nepal	6	4	14	7	8
Poland	4	2	2	5	8
Belgium	2	11	8	6	6
Japan	7	8	7	8	6
United Kingdom	2	2	3	4	5
Thailand	3	3	3	4	4
Austria	5	5	4	4	3
India	2	2	2	3	3
South Korea	2	2	2	2	2
Other	19	26	22	18	20
Total	**218**	**254**	**236**	**229**	**239**

The higher exports than imports are attributed to less complete reporting for imports.

Source: FAO, Global Trade Atlas, Statistics Canada and some AAFC estimates for 2006 - June 2007

Prices
Canadian prices are determined mainly on an export basis because Canada exports about 65% of its production. Therefore, they are highly sensitive to the value of the Canadian dollar in foreign markets. Since there is no futures market for mustard seed, prices are negotiated directly between the producer, dealer, and customer based on supply and demand factors for each type of mustard seed. Some mustard seed is grown under production contracts, which guarantee a price for part of the production, and the rest is sold on the spot market.

For 2006-2007, prices for No.1 grade of all types of mustard seed are expected to average significantly higher than for 2005-2006, because of the lower supply.

OUTLOOK

World: 2007-2008
World mustard seed production (excluding India, Pakistan, and Bangladesh) is forecast to increase by 7% from 2006-2007 to 520,000 t, due to higher production in Canada.

Canada: 2007-2008
Area seeded is expected to increase by 18% from 2006-2007 due to lower carry-in stocks and higher prices.

Assuming normal abandonment rates and trend yields, production is forecast to increase by 25% to 145,000 t. Production is expected to increase for all three types. Assuming normal growing and harvest conditions, quality is expected to return to normal and be slightly lower than for 2006-2007. Supply is forecast to decrease by 20% because of lower carry-in stocks. Exports are forecast to fall slightly because of the lower supply and carry-out stocks are forecast to decrease further.

The lower supply is expected to support prices, with average prices increasing significantly for all three types.

The main factor to watch is weather conditions, especially precipitation, during the growing and harvest periods.

Canada: longer-term
There is strong and growing demand for mucilage and plant breeders have responded by developing yellow mustard seed varieties with higher mucilage levels. Newer varieties, Ace and Andante, have mucilage levels which are about 30% higher than traditional varieties. Work is continuing on developing additional varieties. Higher mucilage levels are expected to increase demand for yellow mustard seed, as marketers promote the value of the product to end users. Producers could only receive premiums for growing varieties with high mucilage levels through segregation and identity preservation because there is no way to measure mucilage levels at the plant. However, premiums for high mucilage may not always occur if the price of yellow mustard seed is too high, because users of mucilage may switch to substitute products, such as guar gum.

Demand for mustard seed is expected to increase during the next decade due to increased population, increased use of spices and increased demand for other uses such as mucilage.

A potential additional use of mustard seed could be for biodiesel. Oil crushed from mustard seed can be used in the production of biodiesel, a fuel for compression-ignition engines coming from biological sources. However, the mustard seed oil price would have to be competitive with alternative sources, such as soyoil and canola oil. Therefore, biodiesel might become a market for low quality mustard seed.

Demand is expected to grow from end users for identity preservation (IP) to ensure specific quality characteristics. IP systems ensure traceability of product from the end-user back to the producer. It involves documentation for each step of production, handling and processing, as well as production, handling and processing standards, and auditing. Although there will be extra cost in an IP system, it will be an important marketing tool for Canadian mustard seed. The mustard seed industry is beginning to use the CGC's Canadian Identity Preserved Recognition System (CIPRS) to assist in the marketing and delivery of special product characteristics. CIPRS certifies companies' identity preserved programs provided they have effective quality management systems and traceability for the production, handling and transportation of specialty products.

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